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ABSTRACT

Existing research on supply and demand (S&D) in adult literacy education in the United States was reviewed to determine the types of data needed to model S&D more accurately. Recent state/national studies of literacy service providers/technology, data on the demand for literacy instruction, the recent National Adult Literacy Survey, and studies of participation were reviewed. It was discovered that few S&D studies in adult literacy have gone beyond enumerating service providers or examining barriers to further participation (demand). The S&D equations for literacy instruction in the United States were found to be complicated by several factors: changing demands for basic skills in the workplace, an increase in immigrants with limited command of English, changing federal welfare policies, and limited awareness on the part of persons with low reading/writing ability that their skills are insufficient for everyday needs. Types of data required for modeling S&D were identified. It was concluded that the S&D characteristics in U.S. literacy policy have not been well understood, S&D are often poorly equilibrated, and recent national studies can provide useful guidance toward providing a better S&D balance. (The bibliography contains 24 references. Appended is a table detailing funding of/participation in California's work force literacy programs.) (MN)

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NCAL

NATIONAL CENTER ON ADULT LITERACY

SUPPLY AND DEMAND FOR LITERACY INSTRUCTION IN THE UNITED STATES

Richard L. Venezky
University of Delaware

Daniel A. Wagner
University of Pennsylvania

NCAL TECHNICAL REPORT TR94-10
SEPTEMBER1994

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SUPPLY AND DEMAND FOR LITERACY INSTRUCTION IN THE UNITED STATES*

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Abstract

The supply-demand equations for adult literacy instruction in the United States are complicated by (a) changing demands for basic skills in the workplace, (b) an increase in immigrants who have limited command of English, (c) changing federal welfare policies, and (d) limited awareness on the part of those with low reading and writing ability that their skills are not sufficient for everyday literacy needs. This paper reviews critical features of the supply of literacy instruction, drawing on recent state and national surveys of service providers and of technology; data on the demand for literacy instruction; the recent National Adult Literacy Survey (NALS); and studies of adult literacy participation. Attention is given especially to the types of data that are required for modeling of supply and demand. The paper concludes that the supply-demand characteristics in U.S. literacy policy have not been well understood, that supply and demand are often poorly equilibrated, and that recent national studies can provide useful guidance toward providing a better balance between supply and demand.

* An earlier draft of this paper was presented at the Organisation for Economic Co-operation and Development (OECD) seminar on *Lifelong Learning: Matching Supply with Demand*, Paris, October 21-22, 1993. We are grateful to the participants of this seminar for comments on the original version of this paper and to Hal Beder for helpful suggestions on the current draft.

INTRODUCTION

Studies of supply and demand in education in the United States have in the past been limited primarily to higher education (e.g., Clotfelter & Rothschild, 1993; Hight, 1976; Radner & Miller, 1975). With compulsory elementary and secondary education, few special issues related to supply and demand have arisen at these levels aside from the potential impact of a GED diploma on earnings (Cameron & Heckman, 1991; Maloney, 1991). For adult education and particularly for literacy instruction, considerable attention has been given to the mismatch between worker skills and projected workplace skill needs (Johnston & Packer, 1987). However, few supply-demand studies in adult literacy have gone beyond enumerating service providers or probing the barriers to further participation (i.e., demand). Furthermore, as Mishel and Teixeira (1991) demonstrate quite effectively, a projected mismatch between worker skills and the skill demands of the workplace may be highly exaggerated.

In this paper, a foundation for relating supply and demand in adult literacy is provided, drawing upon several recent studies of service providers and of adult literacy skills and adults' attitudes and beliefs about their literacy skills. This paper does not attempt to build a quantitative model of supply-demand relationships, but rather describes the kind of work necessary for this long-range goal. In the section that follows, some of the problems in interpreting supply-demand data are discussed, not as an excuse for lack of exactness, but as a reminder of the uncertainty that will accompany even a finished product. The next section describes the available information on the supply of literacy instruction and on the demand for such instruction, relating it to policy formation in the United States and other countries in the Organisation for Economic Co-operation and Development. Finally, the conclusion provides an outline of research needs for working from this foundation to a supply-demand model.

DEFINING LITERACY INSTRUCTION

In the United States, the label "adult literacy" is applied with relative abandon to a wide range of adult education programs, many of which have little or no concern for basic reading and writing. Part of this definitional problem rests with the lack of agreed definition of *literacy*, but part also results from federal and state practices in the allocation of literacy funds to basic education and workplace education programs. The California Workforce Literacy Task Force found this problem in evaluating literacy in the State of California workforce, and wrote that "the concept of 'literacy' is interpreted broadly in studies of workplace or workforce literacy. In use, it has come to stand for a wide range of skills including but going beyond the traditional ones of reading and writing. Other skills frequently referred to by the term 'literacy' include oral language communication, mathematics, thinking and reasoning, problem solving, learning, teamwork, interpersonal skills, planning, organizing, and so forth" (California Workforce Literacy Task Force, 1990, pp. 4f).

Entry-level basic literacy courses, often taught by tutors in one-on-one settings, generally have a strong focus on basic reading and writing, but even these courses might include basic mathematics, life skills such as how to apply for food stamps, and general information on nutrition and other every day concerns. Adult secondary education programs, in contrast, typically concentrate on the subjects required by the General Educational Development (GED) Tests, which consist of subtests for writing skills, social studies, science, literature and the arts, and mathematics. Students who enroll in these courses presumably have reading and writing skills equivalent to those of secondary level students. However, enrollment and progress data from these programs are usually aggregated with similar data from the introductory levels of adult basic education (ABE) for state and federal reporting. At the workplace, the issue of designating literacy programs becomes even more complex, in that many workplace programs are oriented toward the specific skill needs of local jobs and these needs go far beyond print-based interactions.

Although the designation *literacy instruction* is retained for this paper, it should be understood that this label is loosely defined as basic adult education, where reading, writing, and oral communication form the core of instruction but may not be the sole constituents.

SUPPLY OF LITERACY INSTRUCTION

An important source of information on the supply of literacy instruction in the United States is the National Evaluation of Adult Education Programs (NEAEP), which began collecting data on federally funded English as a second language (ESL), adult basic education (ABE), and adult secondary education (ASE) service providers and their clients in April 1991 (Development Associates, Inc., 1992, 1993). Through the cooperation of state and local educational agencies, 2,819 service providers who received federal Basic State Grants funds in the program year ending June 30, 1990 were identified in the 50 states plus the District of Columbia. Of these, 2,619 returned surveys.

Among the programs[1] surveyed, 68% were administered by local educational agencies, 17% by community colleges, 6% by community-based or volunteer organizations, 6% by vocational or technical schools, and 2% by regional service agencies or consortia of school districts. Typical of this latter category is the Finger Lakes Regional Education Center for Economic Development in central New York State. This consortium of service providers, consisting of the City of Rochester public schools, vocational and technical high schools, and colleges, develops generic curricula that can be delivered to workplaces anywhere within its region (Business Council for Effective Literacy, 1990).

About 91% of all persons served by federally funded programs are enrolled in programs administered by either public schools (63%) or community colleges (28%). Most of these programs (65%) operate on a 9-month academic schedule; the remainder operate year around. Evening students, who compose 54% of the clients, typically attend for 2-4 evenings

per week. Only about 10% of all clients receive instruction during 5 or more days per week. The median service provider (i.e., program) offers services at 3.4 sites, where site enrollment varies from 4-5 to 25,000 individuals. About 59% of all programs offer instruction in public school buildings, 42% in adult learning centers, 27% in correctional facilities, 25% in workplaces, 24% in community centers, 7% in vo-tech schools, 6% in private residences, 6% in churches, and 1% in libraries. Almost all programs report offering a variety of support services along with instruction, including counseling (91% of the programs), job search help (82%), and transportation (52%). Fifty-seven percent of the programs reported offering four or more services.

Complementing the federally funded programs are literacy volunteer organizations like Laubach Literacy Action (LLA) and Literacy Volunteers of America (LVA), which provide not only volunteer-based literacy instruction but also methods and materials for other local, state, and federally funded programs. According to a recent study (Tenenbaum & Strang, 1992), LLA and LVA accounted for about 150,000 active volunteer tutors and administrators in 1990. These volunteers work with programs that provide either basic skills instruction, usually through individual tutoring, or English as a second language (ESL) instruction, usually in small groups. About 200,000 learners each year are served by LVA and LLA volunteers through about 1,450 state and local affiliates or councils, accounting for less than 10% of all adult learners served in ABE programs in the United States.

The supply of adult literacy instruction can be viewed from two different perspectives. The first is grouped according to program organizations, that is, the agencies that recruit instructors, arrange sites for service delivery, and provide the curriculum and materials. The second is by program sponsor, that is, the agency or organization that provides the primary identification for the clients. The distinction between these two perspectives is exemplified by literacy programs in correctional institutions, many of which are managed by community colleges. Although the program design will typically be a collaborative effort of the correctional institution and community college staff, the program will be managed by the community college. In fact, a community college (or other sponsoring agency) may develop and deliver basic skills programs for a variety of other settings, including workplaces, correctional facilities, and community centers, while at the same time offering similar programs on a non-credit basis on their own campuses.

A sense of the two perspectives just mentioned can be gained from Table 1 (see Appendix), which is taken from the California Workforce Literacy Task Force report (California Workforce Literacy Task Force, 1990). This table includes not only federally funded adult literacy programs but state and local programs that either provide or could provide basic skills training. The 13 programs listed in this table provided basic skills instruction during the 1990-91 fiscal year to almost 600,000 adults. The largest number of clients were served by "adult schools," which are administered by local school districts. Next in client size were the 70 Adult Regional Occupation Centers and Programs, which offer centralized vocational education training to out-of-school youth and adults as well as high school students. About 14% of clients were served by community colleges, about 8% by Job Training Partnership Act (JTPA) programs, and a little over 8% by the Division of Apprenticeship Standards. This latter program is a cooperative effort of industry and government wherein apprenticeship programs at industries offer career training in over 400

occupations. The California apprenticeship program, which has the highest enrollment of any such program in the United States, is funded primarily by industry.

The NEAEP survey reported that 3,696,973 clients were served by federally funded programs in 1990. Within these programs, over 80% of the instructional staffs worked part-time, over 95% had college degrees, and almost 88% were certified to teach, but not necessarily in adult education. (Only 31% of the reporting programs had at least one person certified in adult education and only 32% reported provision of directed in-service training.) About 75% of the programs use volunteers, usually as tutors.

Missing from these data are various special programs in which basic skills training is only a small part of instruction. For example, many cities offer special programs for pregnant teenagers who drop out of school. Included within the training offered are prenatal care, child rearing, nutrition, and traditional educational subjects, including basic literacy skills. Similarly, almost all of the union-industry training centers, such as the joint UAW-Chrysler Training Centers, offer basic skills instruction among many other types of training, and often have retraining programs for unemployed workers. A different problem in delimiting the supply of literacy instruction is encountered with workplace programs, which might be traditional basic skills programs taught at work sites, or technical skills training programs especially adapted for the job mix of particular workplaces. In the latter case, the basic skills component of the programs might be quite marginal. The growing domain of "intergenerational" programs is also not included in either the NEAEP data or the State of California tabulations. These programs typically provide three types of training: (a) intellectual, emotional, and social assistance for disadvantaged children; (b) basic skills instruction for adults; and (c) assistance for parents in fostering their children's schooling.

Finally, many adult literacy programs operate on an open entry/open exit philosophy. That is, in the vast majority of adult literacy programs in the United States, students may enter at any time of the academic year and can exit as they choose. Furthermore, in GED programs, students typically study until they feel ready to take the GED Tests; if they pass, they leave the programs regardless of the time of year.

Problems Faced by Suppliers of Literacy Instruction

Although a seemingly large network of suppliers exists for literacy instruction, this network is characterized by a number of weaknesses that greatly reduce its effectiveness, either to handle the current demand for services or to expand significantly to accommodate a larger proportion of those in need of services. First, the United States does not have a coherent infrastructure for adult education. Unlike the public school system that delivers services for K-12 students, adult education does not yet have an integrated regional or national organization that would allow consistent communication of information, data collection, and professional advancement. Less than a third of the paid professionals in the field and far fewer of the volunteers are certified to teach adult education; furthermore, supervised in-service training is not common among such programs. The U.S. Department of Education, primarily through the Office of Vocational and Adult Education, has attempted to provide data collection and

communications for the adult education programs that receive federal funding, but these activities are dependent for success upon the cooperation of organizations at the state and local levels, which vary considerably in the quality of their record keeping.

Due to a tradition of limited federal support, adult education programs have been dependent upon multiple sources of funding for basic survival. Exact data on funding for adult literacy programs is difficult to compile, since the largest proportion of this funding derives from state and local sources. For example, although the federal government provided about 57% of the funding for adult basic education programs in 1980, that figure had dropped to 20% by 1991 (NAEPDC, 1991). Also, the amount of federal support registered depends upon the range of federal programs that are classed as relevant to adult basic education. For example, $235.8M was allocated in 1992 through the U.S. Department of Education for basic grants in adult education. However, when consideration is given to funding of other literacy-related programs in the Department of Education, such as Migrant High School Equivalency, Commercial Drivers Program, and Bilingual Family Literacy, as well as literacy programs administered through other federal agencies, such as the Department of Defense's Navy Skills Enhancement Program, the total figure for adult literacy and basic skills programs for 1992 reaches $362.4M (U.S. Congress, 1993, p. 139).[2]

In the United States, federal and state funding has increased dramatically in the past decade (NAEPDC, 1991). From 1980 to 1991, state and federal expenditures rose almost four and a half times, from $174.3M to $779.0M, representing an increase from $84.69 per student per year to $209.35 per student per year. These amounts, however, still leave many programs dependent upon volunteers for tutoring and other activities. In addition, adult education funds are minuscule compared to funding for food stamps and a variety of other federal welfare-related programs, or when compared to the cost of education for elementary and secondary formal school students (more than $3,000 per year per student). A recent Office of Technology Assessment report concluded, "The Federal literacy expenditure is small in comparison with overall State expenditures for literacy and for other major Federal education programs..., meager in terms of the total population in need, and low as a national priority..." (U.S. Congress, 1993, p. 12).

A further problem is the uneven distribution of services. Workplace programs, for example, are generally restricted to larger industries that can afford to have workers away from their jobs during training. Small businesses (i.e., businesses employing fewer than 500 persons) have been reluctant to invest in workplace programs, particularly for entry level workers, yet these firms employ 56% of the private sector workers. Approximately 35 million workers, representing about one third of the private sector workforce, are part-time, temporary, or under short-term contract. These "contingency workers" are the ones for whom employers have shown the least interest in providing skills training. Of the $40B spent annually by employers for formal training courses, the American Society for Training and Development estimates that only about $250M is allocated for basic skills (Marshall & Tucker, 1992). In total, only about 13% of the American workforce gets any formal on-the-job training in a given year. In some European countries (e.g., Sweden and France), this figure is more than double (see Hirsch & Wagner, 1994).

Furthermore, service delivery is seldom coordinated, either across basic skills programs or across other social services. Many adults will enroll in several different basic skills programs within the same city, yet few cities or states have client tracking systems that would allow convenient transfer of educational records across programs. Similarly, although coordination of social services is recognized as a major issue in adult literacy supply, relatively little progress has been made at the federal level in unifying different definitional, eligibility, and reporting requirements across services.

Finally, although computer and video technologies are rapidly becoming a major partner in elementary, secondary, and post-secondary education, they are not yet used productively by most literacy programs (U.S. Congress, 1993). Only about 15% of all adult literacy service providers use computers regularly for instruction, and most other technologies such as home video game machines, instructional television, and hand-held electronic devices (e.g., calculators and dictionaries) are under utilized in adult literacy. Lack of funding for capital purchases is one barrier to the further use of technology to supply adult literacy instruction; another barrier is the lack of technically trained staffs.

THE OVERALL STATE OF SUPPLY

In summary, a large amount of recent data on adult literacy service providers, funding, and technology usage is available. However, these data are still far from complete, and suffer from the lack of agreement on how to identify an adult literacy (or adult basic skills) program. No matter what agreement might be reached on definitions, the analysis of supply will require dealing with many programs that spend only part of their instructional time on basic skills. Also remaining to be addressed is the content of the various instructional programs. Adult basic skills programs differ dramatically across sites, even within the same categories (e.g., beginning ABE). Since the mix of reading, writing, mathematics, and life skills is primarily a local option and without well-established curricula, comparisons across classes are difficult to make. Instructional methodology is also unspecified for most programs.

Any attempt to model the supply of literacy instruction services will need to establish a typology of services based upon instructional content (e.g., ESL, basic literacy skills, life skills, job training with basic skills support). Then, the suppliers of these services will need to be sorted into categories that reflect the important differences among programs, and estimates will need to be made from direct and indirect sources of the resource requirements and capacities within each category. A complete supply model should describe a core of literacy delivery sponsors, including the agencies or organizations that offer services directly to clients. A second layer of such a model would contain those service providers that offer all or the significant components of instruction by contract with what are termed here the sponsors. Thus, a community college that offered basic education courses at its own site as well as similar services at a prison would be represented at two different levels in the model: first as a sponsor, and then as a supplier. In gauging the capacity of the total system to expand, one would need to know the potential of a such a community college to expand both its own offerings and those provided to other agencies. It is important to understand, therefore, for each sponsor, what portion of their instruction is organized and offered

by the sponsoring organization itself and what proportion is supplied by other agencies.

A further need is to estimate the potential influence of technology on supply. For example, the expansion of prison literacy programs might occur through hiring of more instructors; alternatively, computer-assisted instruction or distance learning might be used, with a smaller expansion in the instructional staff. Data from communities that are already using these technologies would be needed, including information about the potential learning that could be attributed to each for given resource allocations (e.g., computers, long-distance phone lines, and technical personnel).

DEMAND FOR LITERACY INSTRUCTION

Demand for literacy services derives from either compulsory sources (e.g., the JOBS program in the United States) or from personal decision. At present 10 to 15% of the clients for federally funded ESL, ABE, and ASE programs claim that they attend because they are required to do so (Development Associates, Inc., 1993); the remainder attend on their own volition, but their reasons for attending vary considerably. One approach to understanding this latter group is to assume, as in other studies of decisions under uncertainty, that their choices are based upon preferences, expectations, and opportunities. Unfortunately, data for examining demand from this standpoint are nowhere near sufficient to illuminate the problem. Instead, we will consider two different approaches for estimating future demand and discuss within them issues that might eventually lead to more sophisticated modeling. One approach is based upon estimates of educational needs compared to current and projected educational characteristics of the U.S. population; the other uses projections based upon current demands. Each of these is discussed below.

PROJECTIONS BASED UPON ESTIMATED NEEDS

The first method of demand estimation might be based upon either a years-of-schooling criterion or a literacy performance criterion, wherein those in the general population who were below criterion would be considered "in need," and therefore representative of the demand for adult literacy instruction. For example, we could assume that all persons 16 years of age and older who are both out of school and without a high school diploma are the target population for literacy instruction, even though they may not request such services. For 1991, this segment of the U.S. population represented 23.7% of all persons ages 16 or older, or about 45.4 million individuals (NAEPDC, 1991, p. 8).[3] In this same year, a little over 3.7 million persons were enrolled in federally funded literacy and basic education programs. This represents about 8% of the eligible pool and this 8% is within the range of 5-10% that is often cited for the percentage of those in need who actually participate in literacy programs (Wikelund, Reder, & Hart-Landsberg, 1992).

One problem with this approach is that the years of school completed decreases with increasing age in the United States so that a disproportionate percentage of older persons fall into the target population, even though there is little likelihood that many of them would want further basic skills training or high school certification. According to the National Adult Literacy Survey, the average years of schooling for 25- to 39-year-olds is 12.9 years, while that for 55- to 64-year-olds is 11.8 years, and for those 65 years and older, 10.7 years (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993, p. 32). Among 16- to 24-year-olds, only 11% of the general population has not completed high school and is not currently in school (Thorne & Fleenor, 1993).

A second problem with this approach is that many people with high school diplomas or even post-secondary degrees are in need of literacy instruction. The NEAEP Survey reports that 33% of the clients who came to ESL, ABE, and ASE programs between mid-April 1991 and mid-April 1992 had a high school diploma or post-secondary degree (Development Associates, Inc., 1993, p. 27). Further problems derive from the possibility that many adults without high school diplomas are satisfactorily employed and probably do not see themselves as in need of further literacy training.

Similar problems would arise if a criterion level based upon literacy performance were adopted. We might, for example, establish level three on the recent National Adult Literacy Survey (NALS) as a necessary criterion for adult functioning. However, this would be even more suspect than the high school diploma criterion in that no relationship has yet been established between NALS literacy levels and either job performance or social, political, and economic functioning. Although the high school diploma criterion has no greater validity as an indicator of intrinsic ability, it is an accepted indicator of educational success and a necessary condition for access to some types of post-secondary education.

The second technique would utilize current demand for literacy instruction to estimate future demand. One component for estimating current demand is the GED program, which is the primary avenue for those who have dropped out of school and do not choose to return to a regular K-12 classroom. GED Tests' administrations have fluctuated around the 750,000 mark over the last decade and a half, with a slight decrease in the last year (GED Testing Service, 1993). However, since the average individual taking the GED Tests reports studying only 30.5 hours for the tests, and many do their studying by themselves or with tutors, even large increases in test administrations would not necessarily translate into large increases in GED class enrollments. Thus, while increasing skill requirements for employment might motivate more high school dropouts to seek a GED certification as an avenue to further training, the actual increase in GED course enrollments that might result would probably be less than 50% of those seeking GED certification.

How different age cohorts might perceive the value of GED certification could be estimated from the *1991 Statistical Report*, which shows that only 2.8% of those who attempted the GED Test in 1991 (22,569 persons) were age 50 or older and only 8% (64,483 persons) were in the range 40-49 years of age (GED Testing Service, 1992). It is unlikely that a major increase will occur in these figures, especially since the most common motivation for

taking the GED Tests is access to post-secondary training and older persons are not likely to increase dramatically their interest in this type of instruction.

Similar analyses would need to be done on other types of adult literacy programs, including especially ESL and ABE programs. In addition, demand based upon current and projected enrollments would need to be attenuated for attrition. For example, 15-20% of those who complete intake procedures for ESL, ABE, and ASE programs do not attend a single class, and of those who receive at least one hour of instruction, only 40% are active after 20 weeks and only 12.5% are active after 40 weeks (Development Associates, Inc., 1993). A strong model for estimating demand would need to predict the strength of demand where cut points along a demand continuum would be related to (estimated) time spent in instruction.

Estimates of future demand based upon current enrollment figures would need to take into account the number of people who want literacy instruction now but are unable to locate a program with available space for them. Literacy sponsors (at local, state, and federal levels) often say that they are "oversubscribed" and simply do not have the resources to fill "long waiting lists." This claim has rarely been challenged, both due to the dearth of data, and due to the political sensitivity of the issue in the United States. Nearly 50% of the programs surveyed in the NEAEP, however, reported that they were operating under their capacity and only 25% reported having clients on a waiting list (Development Associates, Inc.,. 1992). This finding suggests that the perceived demand for programs may be substantially overestimated.

Finally, if future enrollment is to be estimated from current enrollment, sample selection bias will need to be considered. Almost all of the characteristics of the target population for literacy instruction will be based upon those who either attend classes or complete intake interviews. If this is only a small part of the total population in need of instruction, then sample selection bias could be significant.

Given these present conditions, the two most pressing tasks in modeling demand are (a) to learn more about the characteristics of those who have inadequate literacy skills but do not currently request literacy instruction and (b) to determine what conditions might produce a major change in the number of persons seeking basic skills training. On the first issue, studies of expectations formation related to higher education may provide methodological assistance (e.g., Manski, 1993). For the second issue, we discuss briefly below several potential conditions for changing demand.

PROFESSIONAL AND PERSONAL MOTIVATIONS

When employment is scarce, as is currently the case in the United States, individuals at all skill levels appear to be more willing to invest in further education. Part of the explanation for this behavior is that the perceived returns on education increase under tight job market conditions, but another factor is probably that more discretionary time is available for class attendance. Data are needed, therefore, for estimating the potential increase or decrease in demand for basic skills enrollments under differing employment conditions. It would be especially helpful to have data that could demonstrate to potential adult learners the economic impacts of additional skills learned in ABE or GED programs. Some work on the impact of GED certification has been done (e.g., Cameron &

Heckman, 1991; Maloney, 1991), but it is limited to specific age or gender groups.

Job retention and job advancement are also strong potential motivators for further basic skills training, but once again it is unlikely that older persons will decide in large numbers to attempt to advance their occupational status. For younger persons, an increase in the skill requirements of jobs could motivate further training. However, in spite of claims of a major upgrading of the skill requirements of jobs to be created over the next six years, careful analyses of current trends and of labor forecasts show that only a modest increase in skill requirements is probable, either for new jobs or for existing ones (Mishel & Teixeira, 1991). Nonetheless, it is likely that the minimal levels of literacy and numeracy required for employment will increase, thus producing a modest increase in motivation for basic skill training.

The pursuit of personal goals, such as Bible reading, travel, intellectual development, and helping read to children, has often been mentioned by program providers as an expressed need of adult learners, and this presumed demand has achieved much visibility in public campaigns that promote literacy in the United States. Even so, little is known about the sustainability of personal (as contrasted with professional) goals as a motivator for adult learning. Demand for learning might also derive from community needs, such as training for community governance positions. More individuals might be expected to pursue adult basic education if they had increased amounts of discretionary time, but there is no evidence that the average worker today is working for any less time than two or three decades ago.

FEDERAL POLICIES

Over the past three decades, federal and state policy changes, particularly those that involve new funding for education, appear to have influenced participation in adult literacy instruction. In analyzing the impact of the GED diploma on individual earnings, Cameron and Heckman (1991, p. 3) concluded, "The growth in the level and proportion of exam-certified high school credentials is a direct consequence of federal and state human resources policy." The most dramatic increases in GED Tests administrations occurred during the period 1963-1973, when the number of administrations per year jumped from 80,000 (1963) to 690,000 (1973). During this same period, significant increases in federal funding for GED programs resulted from the Adult Basic Education Act (1966) and various federal programs for support of post-secondary education that required a high school degree or equivalent (e.g., National Defense Student Loans and work-study support programs).

A similar increase in enrollment in basic skills education (ABE and ESL) has occurred over a period when funding for basic skills education increased rapidly. From 1967 through 1992, enrollments in adult literacy programs increased from 389,000 to an estimated 3.6 million individuals, nearly a ten-fold increase in enrollment. The increase in state and local funding over this same period was even more dramatic: from $8.3M in 1967 to an estimated $560.0M in 1992 (Office of Vocational and Adult Education, 1991). The Family Support Act of 1988, which legislates changes to Aid to Families with Dependent Children (AFDC), may affect future demand, but its impact

will depend upon the amount of education mandated by state JOBS programs. So far, states have not been particularly successful in enrolling teen parents in the JOBS program (U.S. General Accounting Office, 1993).

Although these cases might suggest how changes in federal funding policy are related to changes in basic skills program enrollments, we have insufficient information for understanding how the funding impacts on individual demand. Studies of adult literacy participation show that the factors that control participation relate strongly to individual life situations and to perceptions of the returns from further education (Wikelund, Reder, & Hart-Landsberg, 1992). Wikelund et al. argue that participation in adult literacy programs is not the only route to improvement of literacy skills, that adults engage in continual learning through social interactions and other context-derived experiences, and that informal learning may offer as important an avenue for skill improvement as formal instruction. This conclusion suggests that program supply, which is clearly a function of resource allocation, is still not clearly linked to the development of individual demand.

IMMIGRATION

In federally funded adult literacy programs today, almost two thirds of those enrolled are non-native speakers of English. Continued immigration might, therefore, provide a continuing pool of participants in adult literacy programs. The size of this pool is difficult to predict from year to year, however, as it depends upon generally unpredictable world events. Again, changes in federal policy can have a large effect upon the enrollment of at least one segment of this population—the undocumented (illegal) immigrants. Because of their undocumented status, these individuals were not previously eligible for federal support for basic skills training, and the majority, when offered support from other sources, were generally reluctant to participate in any situation where their undocumented status might become an issue. However, with the Immigrant Reform Control Act of 1986 (IRCA), undocumented persons who resided in the United States prior to 1982 became eligible for residency by either (a) demonstrating a minimal understanding of U.S. history and of ordinary English, or (b) enrolling in a course of study for obtaining these skills and knowledge.

In the State of California alone, 1.6 million amnesty applications are expected, 90% of which will be from persons over 18 years of age. Pre-enrollment appraisals of 265,641 such persons in 1992 showed that about 75% would be placed in low beginning or beginning ESL classes. Eighty-nine percent scored below minimum competency on a listening test (English) and 86% scored below minimum competency for reading English. State Legalization Impact Assistance Grants (SLIAG) will provide federal funding to states for facilitating the amnesty process. To date, however, little information is available on the actual number of persons who have enrolled in basic skills or ESL programs as a result of the Immigration Reform Control Act.

JOB SKILL REQUIREMENTS

This topic has been discussed already, with the general conclusion that some increase in enrollment in basic skills programs could occur as a result of a

gradual increase in the demand for workers with at least minimal abilities in literacy and numeracy, but that no dramatic increase in the demand for skills in the workplace is likely to occur over the coming five to six years (Mishel & Teixeira, 1991). An opposite trend could also occur, as younger, more educated workers replace older ones with fewer years of schooling, thus reducing rather than increasing the demand for further basic skills training.

TECHNOLOGY

Just as technology could impact the supply of adult literacy instruction, it could also increase the demand by removing some of the traditional barriers to learning. With telecommunications and hand-held electronic devices, as well as video and audio tapes and creative use of telephones, more persons could be able to pursue learning in their homes, and thus overcome some of the transportation and child care issues that limit their participation now. Current experiments with computer networking and distance learning should provide insights into the potential impact of these technologies (U.S. Congress, 1993). One indicator of such impact comes from the relatively large number of sales to adults of home reading programs like *Hooked on Phonics*. Other data, mostly anecdotal, suggest that a growing segment of adult learners in ABE programs find the technology itself (learning to use the equipment and software) to be as strong a motivator for learning as the curriculum of the program itself.

SUMMARY AND CONCLUSIONS

The supply and demand for literacy instruction should be estimated from current participation rather than from assumptions about who should want such training. Indicators that would justify projection of a dramatic increase in the demand for literacy skills are difficult to find, hence making it difficult to gauge the adequacy of supply. Federal funding increases have been related in the past to dramatic increases in basic skills enrollments, but the likelihood of such large increases in the future is small. Furthermore, we have insufficient data for predicting how different levels of funding would interact with the various barriers identified to further participation. Noticeably absent is a comprehensive understanding of how low-skill adults perceive the potential returns on further literacy training. The high dropout rate now experienced in adult literacy programs indicates a rather large mismatch between what adults expect from such programs and either the efforts required to reach these goals or the content of many literacy programs.

The demand for ESL training by immigrants will probably remain strong for many years, as will ABE training for many of these same people. Furthermore, if travel and child care problems are barriers to participation in adult literacy programs, then newer instructional technologies may increase demand for instruction. In particular, those technologies that would allow adults to continue skills training in their homes could make a major difference on enrollments. For this to occur, however, existing programs would need to

reconfigure their curricula and their service provision techniques to allow home study to be effective.

Further research should examine the impact of federal- and state-mandated skills training (e.g., JOBS) as well as IRCA and other immigration-related policies on program demand. The North America Free Trade Agreement (NAFTA) could also increase the demand for basic skills training by favoring industries that utilize high technologies for manufacturing and service delivery. To achieve a better balance between supply and demand, information will be needed on a continuing basis on job skill needs, client skill levels, and access to instruction. The NEAEP and NALS surveys, among other recent data collection efforts, are major steps toward this end, as are the efforts of the U.S. Department of Education in collecting annual data on the enrollment and progress of students in adult literacy programs. Comparable data from some other industrialized countries suggest that similar problems exist in terms of the gap between public perception and effective, policy-relevant programs for adult literacy instruction. In sum, equilibrating supply and demand in literacy instruction will require both a better data base and the modeling of multivariate relationships, a complex task that remains to be initiated. The outcome of such an effort, if successful, could substantially enhance the provision of adult literacy instruction.

ENDNOTES

[1] In the Development Associates, Inc. reports, *program* is defined as a subgrantee under the federal Adult Education Act. Therefore, the nature of a program varied from state to state.

[2] Development Associates, Inc. (1993, pp. 82ff) reports difficulties, however, in determining the actual sources of funding for local programs, given that federal and state funds are sometimes commingled at the state level. In addition, some federal literacy funding is made directly to local programs while other funding is directed through the state level. Then, some funds for literacy are earmarked for specific activities that are separate from the operations of local programs.

[3] A different analysis of the 1990 Census of Population data found 44.1 million individuals in this category (Thorne & Fleenor, 1993).

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APPENDIX

Table 1

California's Workforce Literacy Programs

Program	Estimated Funding	Estimated Numbers Served
Adult Schools	$461,000,000	199,500 ADA
Community Colleges	129,000,000	86,500 ADA
Regional Occupation Centers & Programs	95,000,000	147,396
Public Libraries	3,063,000	24,249
Job Training Partnership Act	61,600,000	47,230
Employment Training Panel	4,500,325	1,600
Division of Apprenticeship Standards	5,998,000	50,000
California Department of Corrections	58,600,000	15,000
California Youth Authority	30,800,000	6,000
County Jails	5,700,000	5,323 ADA
California Conservation Corps	512,000	1,460
California Literacy, Inc.	Varies greatly	13,625
Literacy Volunteers of America	Varies greatly	1,750
Totals (see caution below)	$853,261,325	599,633

Note: These are estimated funding and numbers served for participants in nonprofit or remedial education programs in Fiscal Year 1990-91, except where noted. See footnote 21, page 41, for sources and additional notes.
CAUTION: Total dollar figure overestimates amounts for the 11 programs with funds listed due to duplicate reporting, such as JTPA monies mixed in the Adult Schools budgets. No fund listing was available for 2 of the 13 programs. For these reasons the total funds given do not accurately state the exact amounts available for adult literacy education. The total numbers served is also misleading because it mixes ADA figures, in which one ADA may involve 2 or more students, with actual individual participation in some programs. Thus, the numbers served is probably underestimated. Apparently no one knows the exact funding or numbers served in these programs.

From the *California's Workforce for the Year 2000*, Report for the California Workforce Literacy Task Force, November 1990, p.27.